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ABSTRACT

McCosh Even Start is a federally funded project at McCosh School in an inner-city Chicago neighborhood and is administered as a partnership between Northeastern Illinois University and the Chicago Public Schools. The program's goals are to help parents: (1) become involved with the school by becoming comfortable at the school, making friends, and having enjoyable experiences; (2) enjoy reading and writing and to replicate these experiences with their children; (3) enjoy and understand science, math, and computer and video technology and to replicate this knowledge with their children; and (4) improve their own literacy and job-hunting skills. This paper describes the program's components, including home visiting, an after-school literacy program, field trips, computer classes, and the use of videotaping and photography to document learning. The paper focuses on the use of computers, video technology, and photography as tools to develop literacy as well as to document the literacy progress of parents and children. Also detailed is an evaluation of results of the program, whereby staff, parents, children, and a video documenter collaborated to use strategies that complimented the program's routine and minimized the interruptions to parent-child involvement. These indicators of literacy improvement included video documentation, parent interest questionnaires, observations, book logs, photo collections with personalized captions, portfolios, informal reading inventories, and parent self-evaluations. The paper's appendix lists software for preschool/early primary programs. (Contains 25 references.) (EV)

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# INTEGRATION OF OLD AND NEW TECHNOLOGY: COMPUTERS, PHOTOGRAPHY, AND VIDEO TECHNOLOGY IN AN EVEN START FAMILY LITERACY PROJECT.

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# A Integration of Old and New Technology in a Program


## Abstract

McCosh Even Start, a federally funded project located at McCosh School in an inner-city Chicago neighborhood, the project is a partnership between Northeastern Illinois University and the Chicago Public Schools. The parent/child components of the program are: home visiting, an after school literacy program, field trips, computer classes, and the use of videotaping and photography to document learning. The adult literacy component includes computer classes, parent club and parent field trips. Computer, video technology and photography were used as tools to develop literacy, but they were also used to document the literacy progress of parents and children. To evaluate the results of the program, staff, parents, children and a video documenter collaborated to use strategies that complimented the routine in the family literacy program and minimized the interruptions of the parent/child involvement. Indicators of literacy improvement included video documentation, parent interest questionnaires, observations and book logs, photo collections with personalized captions, portfolios, informal reading inventories and parent self-evaluations.

## INTEGRATION OF OLD AND NEW TECHNOLOGY

Nowadays, many preschools and kindergarten-primary classes have computers in the classroom. Video technology, however with the use of the scanner to scan photos into the computer, the use of digital cameras is just beginning to be used in preschool and kindergarten classes. In addition, the use of computer, video technology, digital technology, photographs by parents, children and staff to document learning is a new development. In the early and late 70's, when computers were first being introduced into the early childhood classrooms, researchers asked questions about:

- the age at which children would be able to use the computer
- the characteristics of children who were frequent computer users
- the gender of frequent users
- the content areas for which the computer is most useful
- the effect of the computer on social interaction
- the type of software used most frequently
- the choice of the computer area compared to early learning centers

A review of the literature suggests that researchers have found that children of preschool and primary age can learn to enjoy using the computer (Clements, 1987, Shade & Watson, 1990, Hohmann, 1990, Landerholm, 1994, 1998), that preschool children generally prefer to work together with another child on the computer rather than alone, (Buckleitner & Hohmann, 1988, Buckleitner, 1993, Clements, 1987), that children tutor and learn from each other, that they develop positive attitudes toward the computer, increased social interaction at the computer. A computer learning center fits well with traditional learning centers and computers can help facilitate learning through discovery and experimentation (Shade and Watson, 1990, Fishman, 1991, Landerholm, 1994, 1998). Increased social interaction at the computer and positive attitudes toward the computer correlates with increased language use (Buckleitner & Hohmann, 1998, Clements, 1987, Landerholm, 1994, 1998).

Many studies have found no gender difference in young children's use of the computer (Clements, 1987, Perimutter, et, al, 1985, Landerholm, 1994). However, Rosengren, 1985, found that both children and teachers more often perceived boys as expert computer users rather than girls. Elliott, (1993), found that boys' and girls' routes to competence on the computer differ, though both genders display similar play behaviors and learning outcomes. Caftori (1994) in her study of K-3rd graders use of the computer found that even when both boys and girls had a computer at home, boys used the computer more. Boys and girls also used the computer in different ways. Girls used more educational software at home while boys used more games. Weinman and Haag (1999) report a variety of new studies which reinforce the older ones: boys are more attracted to the computer, use the world wide web more, take more computer application and design courses and describe the computer in more inviting terms. A report by the American Association of University Women (1998) found that girls of all ethnicities rated themselves significantly lower than boys on computer abilities and were less likely than boys to think computers help them to do better in school.

In terms of content areas, children can achieve prereading, readiness and writing skills through using the computer (Buckleitner & Hohmann, 1988, Buckleitner, 1994, Butler and Cox, 1992). With the computer, children write more, are less worried about making mistakes, take increased pride in their writing because text looks better, have fewer fine motor control problems and are more willing to take risks and revise (Clements, 1987, Moore, 1991). Several researchers found that a talking version of a word processor significantly increased the amount of editing children performed on their compositions (Borgh and Dickson, 1986, McArthur, 1988). Other studies have reported children's gains in mathematics and problem solving skills (Clements, 1987, Buckleitner & Hohmann, 1988, Faulkner and Anderson, 1991).

As researchers have continued studying young children's use of the computer, research has shifted from looking at how, when, and how long children use the computer, to what type of software is most effective for educational purposes (Haughland & Shade, 1988, Fishman, 1991, Buckleitner, 1992, 1993, 1994, 1996). The High Scope program in Michigan (Buckleitner, 1996) has found that the success of computer based learning for young children depends on:

- the quality of the overall preschool or kindergarten curriculum
- the quality of the computer software
- the software's match with the curriculum

**Video Technology**

Currently, besides using computers, a whole new variety of video technology is available for home use and in the classroom. Scanners, digital cameras are available to bring visual images into the computer. Computer software is available that enables the student to include sounds, video images, and photographs into the text. Video cameras enable children, parents and teachers to record field trips and classroom experiences and play them back for immediate feedback. Children can explore the web and see and hear video images from across the world. Tapscott (1999) describes the current generation as the "Net Generation". He says that children of the net generation are surrounded by digital media, and to them digital technology is no more intimidating than a VCR or a toaster. Lewin (1999) describes children improving their reading by using the world wide web. Pastor and Kerns (1997) describe Kindergarten children using digital cameras for documenting experience. They decided that they would experiment to facilitate reading and writing literacy through the use of the computer. After looking for software to assist their educational goals, they shifted to the use of the digital camera. This decision was reinforced from the book, The Hundred Languages of Children (Edwards, 1993) which describes the Reggio Emilia approach to education (from Italy). This approach stress the importance of observation of real experiences and objects. It also uses photography to document those experiences. In the Reggio Emilia approach, documentation of experiences through photography, drawings, journal writing is seen as being very important for children because it boosts memory, helps guide thinking, helps children become more aware of experiences and more able to articulate what they see.

**Description of the Project**

A family literacy project was set up in a black, inner city public school on the south side of Chicago. The project was set up through a partnership sponsored by an Even Start grant from the Illinois State Board of Education where Northeastern Illinois University (a state university)

worked in a partnership with a Chicago public school. A university professor, several graduate assistants, the principal, the assistant principal, several teachers, parents and the school community representative worked together to design an Even Start program which included the components of an after school program for parents and children to learn together two days a week, a home visiting component, an adult literacy component and a component of field trips for parents and parents and children together. The Even Start guidelines for recruitment of parent participants included having children in the age range of 0-7, and needing to look for a job or work on adult literacy themselves. Funding and time was contributed by the school, the university and the Even Start grant. The program was designed to include support activities to build rapport, such as providing snacks, providing free books, providing activities for older and younger children not enrolled in Even Start, and providing hands on, enjoyable activities for parents. The project was also designed to include educational, achievement type activities related to family literacy, science, math and computers. The curriculum used was the High Scope model developed by David Weikart (1989). This is an open ended curriculum framework emphasizing active learning, where activities can be chosen to fit the needs and interests of the children and parents. Activities were designed that were easy to do, enjoyable, inexpensive, and involving materials that were easy to find at a local store. Activities were also designed so that they could be replicated at home with their other children at a range of ages and levels. The after school program was scheduled two afternoons a week for parents and children together and the parents' club was scheduled one morning a week for parents to work on adult literacy and job and career related skills.

**Goals of the Project**

The goals of the project were:

1) to help parents become involved with the school program by becoming comfortable at the school, making friends, having enjoyable experiences.
2) to help parents enjoy reading and writing and replicate these experiences with their children.
3) to help parents enjoy and understand science, math, computer and video technology and replicate these processes with their children.

4) to help parents improve their own literacy and job hunting skills.

**The After-school Program Component**

The parents and children came two afternoons per week. The daily schedule included snacks upon arriving, then parents read with their children and helped them write book reports for about twenty minutes and then an hour and a half was set aside for parents and children to work at learning center activities. The activities consisted of four stations, an art station of art materials and activities, a science station of science materials and activities, a book making station (using photos and writing text) and listening station and a computer station. The curriculum used was the High Scope Curriculum, which provides an open frame work and allows teachers, parents and children to select learning activities that engage their interest. The High Scope Curriculum is based on the theories of Jean Piaget.

**Computer Equipment**

At the beginning of the project, the computer equipment in the Even Start classroom consisted of the following donated computers: a variety of Apple IIe, Apple IIc, Apple IIGs, Tandy, and IBM computers as well as two Stylewriter printers. One new Macintosh Performa 6300CD was purchased and a Hewlett Packer printer. After four years in the project, the equipment consisted of 3 power Macs with cd roms, (purchased, two new and one rebuilt) 3 Macs (quadras that were donated) and 3 Apple IIGS, two new Hewlitt Packer printers, an Epson printer and two donated Stylewriter printers. The rest of the older equipment was given to parents in a lottery.

**Photography and Video Equipment**

At the beginning of the project, the photography and video equipment consisted of: an Olympus zoom camera, a university Sony high 8 video camera, some inexpensive cameras (under $20) and a couple of Polaroid instant cameras. By year four of the project, the equipment consisted of: a second Olympus zoom camera, a Sony 8mm video camera, a second Sony high 8 video camera, and a scanner.

**Use of Photography, Videotaping, and Scanner for Literacy Instruction and Documentation**

In year one of the project, we used photography. At first, the project director, teachers and parent assistants took photos of the children and parents doing classroom projects and going on field trips. We took the photos, had 2 sets developed, used one set for documentation and the other set to give to the parents and children. Our original idea was to use the photos for literacy. When the parents got the photos, they would ask their children to tell them about the photos and they would write down what they said and make small books. Later the parents started portfolios (scrapbooks) and included photos from the whole year. The project hired a video documenter to evaluate the program. The video documenter videotaped the classroom experiences and the field trips. She also taught photography classes to the parents and staff members. This expanded the number of people taking photos. It expanded what they saw, how they saw things and what they wrote about. The parents took photos at home and in the community as well as in the program. A parent assistant was hired to do the day to day videotaping. Better equipment was purchased as the inexpensive cameras did not last well: they broke quickly and did not take good pictures. The zoom cameras worked well and all staff became more skilled at photography. At first an inexpensive video camera was purchased, but was not as useful for editing. Later, a Sony-high-8 camera was purchased. Then a scanner was purchased. Some of the parents and teachers who were not as interested in the computer at first, were fascinated by the scanner. Photos could be scanned into the computer, cropped, changed and printed out. Multiple copies of books could be printed and laminated. Children and parents could share their stories with other children and parents. The teachers and parent assistants in the project began to work with the scanner, with photos, with the laminator, with video taping and editing as well as continuing with photography. All the field trips were videotaped, and photographs were taken by parents and teachers. In the after-school program photos and videotapes were made. Afterwards, photos were used with the parents and children to make portfolios, and write stories. The scanner made it possible to scan photos into the computer, change photos, write text and print out multiple copies of the stories.

As well as the use for motivation for literacy, photos were wonderful for documentation. At the end of the year, when a final evaluation report needed to be written, the photos of the

year's happenings were a useful way to jog memory and to see children's and parents' progress. The portfolios were a year long progress report.

**Selection of the Software**

In year one of the project, the teachers weren't very familiar with computer use and also wanted help in choosing software to match with the goals of their curriculum. Therefore, the university professor used High Scope's Survey of Early Childhood Software (Buckleitner, 1996) which reviews early childhood software programs, rating them on user friendliness, educational value, and instructional design, and lists them by conceptual area. It also lists and rates old software that can be used with all varieties of old computers, and lists prices and where this software can be ordered. Using this source, the researcher helped the teachers select software programs with which to begin the after-school computer program for parents and children ages (2-4) software for ages 5-7 and software for older children (8-10) and software for parents' use. Each computer was set up with one piece of software which was changes 2 or 3 times a year. By year 4 of the project, teachers selected software from a variety of sources, the cd rom software was very popular, and the teachers' had their own opinion on the best software to fit the curriculum. (See Appendix 1)

**Adult Literacy/Computer Instruction for the Parents**

The parents were attracted to come to the program because of the computers. Many of these parents have had bad experiences in school, and do not want to do the same old things like workbooks and tutoring, but are curious about the computers and want to be involved in the latest technology. Thus having computers was a great way to get parents interested in coming to the program. Also coming to the after-school program where they would have snacks, read with their children and have choices of doing art projects, science projects, book making projects or computer made the program informal, interesting and less intimidating. The parents did not have to use the computers if they didn't want to. In addition, the parents liked using the computers as a tool for a purpose rather than just typing. When they made a parent directory, they interviewed each other, took pictures, typed up the interviews on the computer and made a directory of all the parents in the program. This was an interesting and functional project. The parents also got interested in the new Macs because they could make birthday and holiday cards. Anything that

they could use in their regular life became attractive. Software used for the parents besides the children' software were: Claris Works, Appleworks, Children's Writing and Learning Center, and Print Shop. The projects that the parents completed on the computer were also used for documentation of learning. For example, a birthday card they made at the beginning of the project could be printed out with a copy for documentation and a copy for the person making the card. Work completed throughout the year could be saved and compared to a final project near the end of the year.

Besides the computer, many parents were interested in video technology. Adults like to see themselves on tv and in photographs as well as children do. Adults also love to see their children in videos and photographs. These images paired with the written word is am interesting way to encourage literacy. Parents read stories and were videotaped. These tapes were loaned out in a video library.

**Results: Childrens' literacy and computer learning**

The children loved the computers. They took to it right away. Children as young as 2 years old could be seen working on Picture Chompers (MECC) on the old Apple11c. They would come right in and sit down and work. Several children would work at every computer. One working and the others watching and telling the other person what to do. The older children would use the cd-rom software and liked the problem solving ones. Again, two or three children would work together and help each other. The old computers are especially useful for young children starting out and for parents starting out. They are less intimidating and don't break easily. Thus old and new technology can be used together.

**Software Selection and Parents' Computer Learning**

The parents were more intimidated. Many did not want to have anything to do with the computer. Others would go over and help their children figure out what to do. As the teachers became more comfortable with the computer, they began to share their experiences with the parents and help tem begin to work on the computer. As some parents became more comfortable, they would help other parents. In year four of the project, we had a lottery to give away some of the old Apple 11 computers and software. The parents were delighted. In addition, by year four, many of the parents had bought computers at home for their children as

they could see how much the children learned using them.

**Teachers and Computers**

The teachers were also intimidated at first. But gradually they gained more confidence. The key early components were to have a computer consultant who was knowledgeable, but also teacher friendly. This communication aspect was very important. Some technology experts do not know how to put teachers and parents at ease. Later as teachers took classes and went to workshops and practiced on the computer themselves, they became more comfortable. Now all the teachers on the technology committee in the primary building are Even Start Teachers. The other critical component was that the teachers had computers in their classrooms. As the children used the software in the classroom, the teachers became more familiar with the process, and also saw the potential, and the success of the computer. The computers in their classroom were Apple IIes, Apple IIcs, and Apple IIGS, all donated. So it is possible for any program to start using computers right away without money. People hate to throw their computers away and are happy to donate.

**Photography, and Video Technology and Video Documentation**

Photography was used in the project in a variety of ways. It was first used to take photos of the children doing projects in the after school program. Then the children would dictate to their parents what they were doing and the parents would write it down. This project was later expanded to include portfolios (scrapbooks) of photos and dictations or writings from the whole year. This project was begun to provide literacy instruction for parents and children in an interesting novel way. Later, teachers and parent assistants on the staff also took videotapes of the children in the after school program and on the field trips. What began as a literacy project then began to take shape as an evaluation project also. The photograph and the videotapes were used at the end of the year to provide data for the evaluation. Teachers were much better at taking pictures than they were at writing documentation of everything that happened. As the project continued, a scanner was purchased, and photos were scanned into the computer. This allowed us to make multiple copies of books, laminate them and other children in the classroom could borrow other children books. Parents and children also took photos. We had cameras: Polaroid, inexpensive cameras, a zoom camera, a video camera. In the next year, we plan to use

the scanner even more and buy a digital camera.

**Reading interest inventories, self report surveys of literacy learning**

In year three and four, a reading professor at Northeastern Illinois University conducted informal reading surveys with the parents as a pre-test to check on their reading levels. At the end of the year a post test was also planned to document progress in literacy. Both years, by the end of the year, the majority of parents had found jobs and were working so they were not able to continue attending the program, and therefore were not able to take the post test. A collaborative solution was devised to solve the problem. The professor trained the parent assistants on staff to give the post test checklist over the phone. This instruction took several workshops. The parent responded well to the parent assistants. They were comfortable in their own home and volunteered additional comments. This collaboration provided a great deal more information about the learning process and the effect of the project, as well as being more cost effective. The training of three parent assistants provided the added benefit of completion of the surveys in a more timely fashion.

**Book Logs**

The parents and children read books together for twenty minutes each day when they came to the after school program. After reading a book, the child wrote up a book report. Prizes were awarded each time a child read five books and wrote up the book reports. A graduate assistant collected the book reports, gave out prizes and recorded the data. One child read almost 300 books in one year! The number of books varied from a few up to 300 during the year. Here again, the book reports was a literacy activity. The prizes were awarded to help begin the habit of reading. The book reports were the documentation for the prizes, but also, then they were available to document the learning process for a final report for the funder. This again was a collaborative strategy for using an instructional activity for two purposes: as an instructional activity and as a documentation/evaluation activity. Book reports began as old technology - Xerox the reports and write in the blanks. Later in the project, photos, scanning and printing multiple copies was added to the process.

**Video Interviews**

Video interviews with parents and children were used as an evaluation strategy as well as an instructional strategy. Parents were able to see and hear what their children thought about the program and what they were learning. Teachers were able to see and hear what parents and children were learning from the program. Technology was an interesting area to engage from staff to administration to teachers and parent assistants in the learning process. Some started on the computer, others began with photography and others got excited about the videotaping, or the scanning. Gradually, all staff began to use all varieties of technology.

**Summary**

All kinds of old and new technology can be family literacy combined in a program. A great deal of equipment can be obtained free. All the old technology does not need to be abandoned. A program does not need to wait until the program wins the lotto! A program can start using technology right now.

**Appendix 1--A Sample of Software**

**Preschool/Early Primary Programs**

**Creative Activities**

A. Older floppy disk programs for Apples
   - Puppet Maker (Spinnaker)
   - Mask Parade (Springboard)
   - Facemaker (Spinnaker)

B. Newer programs for Macs (floppy or cdrom)
   - Kid PIX-(Broderbund)

**Language and Literacy Activities**

A. Older floppy disk programs for Apples
   - Picture Chompers (Mecc)
   - Sticky Bear Shapes and Opposites
   - Children's Writing and Publishing Center (Learning Co.)
   - Sticky Bear Shapes and Opposites (Learning Co.)

B. Newer programs for Macs (floppy or cd-roms)
   - Ultimate Writing and Creativity Center (Learning Co.)
   - Kid PIX Studio Deluxe (Broderbund)
   - Bailey's Book House (Edmark)
   - A to Zap (Sunburst)

**Numbers, Counting, Space and Time**

A. Older floppy disk programs for Apples
   - Counting critters (Mecc)
   - Math and me (Davidson and Associates, Inc.)
   - Math Rabbit (Learning Co.)

B. Newer programs for Macs (floppy or cd-rom)
   - Sammy's Science House (Edmark)
   - Millie's Math House (Edmark)
   - Counting Critters (Mecc)
   - Math and me (Davidson and Associates, Inc.)
   - Math Rabbit (Learning Co.)

**Older Children (ages 9-10)**

**Creative Activities/Language and Literacy**

A. Older floppy disk programs for Apples
   - Kid Pix (Broderbund)
   - Children' Writing and Publishing Center. (Learning Co.)

B. Newer programs for Macs (floppy or cd-rom)
   - Kid Pix (Broderbund)
   - Children' Writing and Publishing Center. (Learning Co.)

**Numbers, Counting space and time/Science**

A. Older floppy disk programs for Apples
   - Math Shop Junior, an intriguing math program.
   - Odell Lake (MECC) A problem solving program.

B. Newer programs for Macs (floppy or cd-rom)
   - Magic School Bus (Sunburst)

**REFERENCES**

Buckleitner, W. (1994). What's hot for computer using tots? Technology and Learning Vol. 14 No. 5. Pp. 14-18.

Buckleitner, W. (1996-1992). High/Scope Buyer's Guide to Children's Software 1996. High Scope Press, Ypsilanti, Michigan.

Buckleitner & Hohmann (1988). Computers in the Classroom. Paper presented at the meeting of the National Association for the Education of Young Children.

Caftori, N. (1994). Examination and evaluation of computer software in relation to gender differentiation and educational effectiveness. Unpublished doctoral dissertation, University of Illinois at Chicago.

Clements (1987, November) Computers and Young Children: A review of the literature. Young Children. Vol. 43, No. 1, pp. 34-37.

Elliot, A. (1993). Effects of gender on preschoolers' play and learning in Logo environments. Journal of Computing in Childhood Education. Vol. 4 No. 2.

Faulkner, H., and Anderson, K. (1991, March). Lego TC logo: Gender differences in a process-learning environment. The Computing Teacher. (Eds. R. Adams, H. II mhof, and L. Flick), 34-36.

Fishman, L. (1991, Spring). Welcome to Muppetville. Solution, Vol. 5 No. 3 p. 4-5 Sunburst Communications.

Haughland, S. And Shade, D. (1988, May) Developmentally appropriate software for young children, Young Children. Vol. 43 No. 4

Hohmann, C. (1990). Young Children and Computers. High/Scope Press.

Kostner, L. (1989, May). Computers in the early childhood classroom. The Computing Teacher. Vol. 16. No. 8. pp. 54-55.

Landerholm, E. (1994). Computers in the Kindergarten. Early Childhood Development and Care Vol. 101, p. 13-22.

Landerholm, E. (1995). Early Childhood teachers' computer attitudes, knowledge, and practices. Early Childhood Development and Care. Vol. 109, p. 43-60.

Landerholm, E. (1998). Computers in Even Start. The School Community Journal. Vol. 8 Number 1.

Lewin, L. (1999) "Site-reading" the world wide web. Educational Leadership. Vol. 56. No. 5.

Mac Arthur, C. (1988, April). The impact of computers on the writing process. Exceptional Children. Vol. 54. No. 6.

Moore, M. (1991, Dec.). Electronic dialoguing: an avenue to literacy. The Reading Teacher. Vol. 45. No. 4

Murphy et.al, (1984). Evaluation of Writing to Read. Princeton, N.J. Educational Testing Service.

Papert, S. (1993, July). The children's machine. Technology Review. Vol. 96. No. 5

Pastor, E. & Kerns, E. (1997) A digital snapshot of an early childhood classroom. Educational Leadership. Vol. 56, Number 3.

Perimutter, et al. (1985). Social influence on preschool children's computer activity. ED 264962.

Shade, D. And Watson, J. (1990). Computers in early education: issues put to rest, theoretical links to sound practice and the potential contribution of microworlds. Journals of Educational Computing Research. Vol. 6, No. 4 pp. 375-392.

Tapscott, D. (1999). Educating the Net Generation. Educational Leadership. Vol. 56, No. 5.

Weikart, David. (1989). Young Children in Action. High Scope Press. Ypsilanti, Michigan

Weinman, J. & Haag, P. (1999) Gender equity in cyberspace. Educational Leadership. Vol. 56. No. 5.